AMENDMENTS TO THE CLAIMS

1   1. (Currently Amended) A method of transmitting signals from a transmitter

2 comprising two or more transmit antennas in a mobile telecommunications network, the

3 method comprising

4   determining channel state information,

5   estimating reliability of the channel state information,

6   space time block encoding at least one data sequence,

7   before transmitting the data sequence, applying to the data sequence a linear

8 transformation so as to at least partially compensate for channel variations, the linear

9 transformation being dependent upon the channel state information and dependent upon

10 the estimated reliability of the channel state information~,~

11   in which where the channel state information is channel estimates in the form of

12 channel coefficients, and the channel state information for a time interval (n) is assumed

13 accurate for the previous time interval (n-1), the channel state information reliability (ρ)

14 is determined as

15       $\rho(1) = 0$

16       $\rho(n) = (1 - \alpha)\mathbf{h}\mathbf{f}^* + \alpha\rho(n-1)$

17   where $\mathbf{h}$ is the channel vector , $\mathbf{f}$ is the latest channel state information , and α is a

18 forgetting factor.

1   2. (Original) A method according to claim 1, in which the channel state

2 information is channel estimates.

1   3. (Original) A method according to claim 1, in which the reliability of the

2 channel state information is determined from latest channel state information and

3 previous channel state information.

1   4. (Original) A method according to claim 3, in which the latest channel state

2 information is given a weight relative to the previous channel state information, the

3 weight being dependent upon channel state information stability.

1   5. (Canceled)

1   6. (Currently Amended) A method according to claim ~~5~~1 in which α is selected

2   dependent on the size of the variation between the latest channel state information and the

3   last previous channel state information.

1   7. (Original) A method according to claim 1, in which the linear transformation

2   is applied before block encoding the data sequence.

1   8. (Original) A method according to claim 1, in which the linear transformation

2   is applied after block encoding the data sequence.

1   9. (Currently Amended) A method according to claim 1, in which the space-time

2   block encoding is such that at a first transmission time instant first symbol is transmitted

3   from a first of the two antennas and a second symbol is transmitted from the second of

4   the two antennas, then at the next transmission instant a negative complex conjugate of

5   the ~~first~~ second symbol is transmitted from the first antenna and a complex conjugate of

6   the second symbol is transmitted from the ~~second~~ first antenna.

1   10. (Original) A method according to claim 9, in which the space-time block

2   encoding is Alamouti space-time block encoding.

1   11. (Original) A method according to claim 1, in which the transmitter is a base

2   station operating according to a code division multiple access (CDMA) or wideband code

3   division multiple access (W-CDMA) transmission scheme.

1   12. (Original) A method according to claim 11, in which the base station
2   operates in accordance with the Universal Mobile Telecommunications System (UMTS)
3   standard.

1   13. (Currently Amended) A transmitter for mobile telecommunications
2   comprising at least two transmit antennas, a space time block encoder, a linear
3   transformation apparatus operative to transform a data sequence from or to a space time
4   block encoder so as to at least partially compensate for channel variations, a processor
5   operative to receive channel state information and to estimate reliability of the channel
6   state information, and a processor operative to determine the linear transformation to be
7   applied dependent upon the channel state information and the estimated reliability of the
8   channel state information~,

9   in which where the channel state information is channel estimates in the form of
10   channel coefficients, and the channel state information for a time interval (n) is assumed
11   accurate for the previous time interval (n-1), the channel state information reliability (ρ)
12   is determined as

13   $$\rho(1) = 0$$

14   $$\rho(n) = (1 - \alpha)\mathbf{h}\mathbf{f}^* + \alpha\rho(n - 1)$$

15   where $\mathbf{h}$ is the channel vector, $\mathbf{f}$ is the latest channel state information , and α is a
16   forgetting factor.

1   14. (Original) A transmitter according to claim 13, in which the channel state
2   information is channel estimates.

1   15. (Original) A transmitter according to claim 13, in which the reliability of the
2   channel state information is determined from latest channel state information and
3   previous channel state information.

1   16. (Original) A transmitter according to claim 15, in which the latest channel
2   state information is given a weight relative to the previous channel state information, the
3   weight being dependent upon channel state information stability.

1   17. (Canceled)

1   18. (Currently Amended) A transmitter according to claim ~~17~~ 13, in which α is

2   selected dependent on the size of the variation between the latest channel state

3   information and the last previous channel state information.

1   19. (Original) A transmitter according to claim 13, in which the linear

2   transformation apparatus transforms the data sequence before it is applied to the block

3   encoder.

1   20. (Original) A transmitter according to claim 15, in which the linear

2   transformation apparatus transforms the data sequence after it is applied to the block

3   encoder.

1   21. (Currently Amended) A transmitter according to claim 13, in which the

2   space-time block encoder operates such that at a first transmission time instant a first

3   symbol is transmitted from a first of the two antennas and a second symbol is transmitted

4   from the second of the two antennas, then at the next transmission instant a negative

5   complex conjugate of the ~~first~~ second symbol is transmitted from the first antenna and a

6   complex conjugate of the ~~second~~ first symbol is transmitted from the second antenna.

1   22. (Original) A transmitter according to claim 21, in which the space-time block

2   encoder is Alamouti space-time block encoder.

1   23. (Original) A transmitter according to claim 13, which is a base station

2   operating according to a code division multiple access (CDMA) or wideband code

3   division multiple access (W-CDMA) transmission scheme.

1   24. (Original) A transmitter according to claim 23, which operates in accordance

2   with the Universal Mobile Telecommunications System (UMTS) standard.

1   25. (Canceled)

1   26. (Canceled)

1   27. (Original) A network for mobile telecommunications comprising a transmitter and

2 a receiver,

3   the transmitter comprising a space-time block encoder and a linear transformation

4 apparatus operative to transform a data sequence from or to the space-time block encoder by

5 applying a linear transformation so as to at least partially compensate for channel variations,

6 the transmitter comprising at least two transmit antennas,

7   the receiver comprising a space-time block decoder and a channel estimator, a

8 processor operative to estimate channel state information reliability from channel state

9 information provided by the channel estimator, and a processor operative to determine the

10 coefficients of a further linear transformation matrix dependent upon the channel state

11 information and the estimated reliability of the channel state information to be applied to a

12 further data sequence for transmission,

13   the coefficients of the further linear transformation matrix being sent from the receiver

14 to the transmitter for use.

COMMENTS

Status of Claims

Claims 1-4, 7-8, 11, 13-16, 19-20 and 23-26 have been rejected under 35 USC 103(a) for obviousness over Walton.

Claim 12 have been rejected under 35 USC 103(a) for obviousness over Walton in view of Ratnarajah.

The Examiner has objected to claims 5-6, 9-10, 17-18, and 21-22 as being dependent on a rejected base claim, but indicated that such claims would be allowable if rewritten in independent form.

Claim 27 is allowed.

Claim 1

Amended claim 1 is a combination of previous claims 1 and 5 in accordance with the Examiner's indication as to allowable subject matter.

Dependent claims 2 to 12

Claim 5 has been canceled.

The dependency of claim 6 has been updated.

As regards claim 9, clarifying amendments have been made, support for which is provided by page 3 lines 17 to 22.

Dependent claims 2 to 4, 6 to 12 are patentable not least on the basis that they each depend on an allowable independent claim 1.

Claim 13

Amended claim 13 is a combination of previous claims 13 and 17 in accordance with the Examiner's indication as to allowable subject matter.

Dependent claims 14 to 24

Claim 17 has been canceled.

The dependency of claim 18 has been updated.

As regards claim 21, clarifying amendments have been made, in line with those to claim 9, and with support provided by page 3 lines 17 to 22.

Dependent claims 14-16, 18-24 are patentable not least on the basis that they each depend on an allowable independent claim 13.

Claims 25 and 26

Claims 25 and 26 are canceled.

Claim 27

Claim 27 is allowed.